MATERIAL SAFETY DATA SHEET

1. SUBSTANCE AND SOURCE IDENTIFICATION

National Institute of Standards and Technology
Standard Reference Materials Program
100 Bureau Drive, Stop 2320
Gaithersburg, Maryland 20899-2320

MSDS Coordinator: Mario J. Cellarosi
Telephone: 301-975-6776
FAX: 301-926-4751
E-mail: SRMMSDS@nist.gov

SRM Number: 351
MSDS Number: 351
SRM Name: Sodium Carbonate

Date of Issue: 26 April 2006

Emergency Telephone ChemTrec:
1-800-424-9300 (North America)
+1-703-527-3887 (International)

Description: This Standard Reference Material (SRM) is certified as a chemical of known assay and is intended for use as a primary acidimetric standard. Each unit consists of 50 g of highly purified sodium carbonate.

Substance: Sodium Carbonate

Other Designations: Disodium salt carbonic acid; bisodium carbonate; calcined soda; carbonic acid sodium salt (1:2); carbonic acid disodium salt; disodium carbonate; soda ash.

2. COMPOSITION AND INFORMATION ON HAZARDOUS INGREDIENTS

Component:	Sodium Carbonate
CAS Number:	497-19-8
EC Number (EINECS):	207-838-8
Nominal Mass Fraction (%):	99.98
EC Classification:	Xi (irritant)
EC Risk:	R22 (harmful if swallowed) R36/37/38 (irritating to eyes, respiratory system and skin)
EC Safety:	S22 (do not breathe dust) S26 (in case of eye contact, rinse with water immediately and seek medical advice)

3. HAZARDS IDENTIFICATION

NFPA Ratings (Scale 0-4): Health = 3 Fire = 0 Reactivity = 1

Major Health Hazards: Contact may cause severe irritation of skin and eyes. Inhalation may irritate or damage the respiratory tract. Ingestion may damage the GI tract; a dose greater than 30 g may cause circulatory collapse and death.

Physical Hazards: May react on contact with water.

Potential Health Effects

Inhalation: Effects include irritation, coughing, and shortness of breath. Repeated or prolonged exposure may damage the lungs and cause perforation of the nasal septum.

Skin Contact: This material may cause irritation, redness, blistering, and tissue destruction. Abraded skin is more strongly affected than intact skin.

Eye Contact:	Sodium carbonate dust may cause severe irritation, redness, pain, and blurred vision. In solution, this material can permanently damage the eye unless promptly flushed with water. Chronic exposure at lower levels may cause conjunctivitis.
Ingestion:	Used as a food additive in small quantities; a large dose may cause sore throat and corrosion of the gastric mucosa, followed by nausea, vomiting, abdominal pain, and diarrhea. Circulatory collapse and death may occur. The estimated lethal human dose is 30g.

Medical Conditions Aggravated by Exposure: No specific data; exposure may aggravate pre-existing conditions affecting target organs.

Listed as a Carcinogen/ Potential Carcinogen:

	Yes	No
In the National Toxicology Program (NTP) Report on Carcinogens		X
In the International Agency for Research on Cancer (IARC) Monographs		X
By the Occupational Safety and Health Administration (OSHA)		X

4. First Aid Measures

Inhalation: Move the person to fresh air immediately and get medical aid. If not breathing, qualified medical personnel may start CPR or give oxygen if necessary. Get immediate medical attention.

Skin Contact: Remove contaminated clothing. Wash affected skin with soap and water. If irritation persists, get medical aid and bring the container or label. Wash contaminated clothing before reusing.

Eye Contact: Remove contact lenses (if any). Flush eyes with running water for at least 15 minutes, keeping eyelids open and raising lids to remove all chemical. Get medical aid at once, and bring the container or label.

Ingestion: Contact a poison control center immediately. Wash out mouth with water, but do not induce vomiting unless instructed to do so. Get medical aid as soon as possible, and bring the container or label.

5. Fire Fighting Measures

Fire and Explosion Hazards: Sodium carbonate itself is noncombustible, but contact with any of several incompatible materials (listed in Section 10) may cause ignition, explosion, or violent reaction upon heating.

Extinguishing Media: Use extinguishing media appropriate to the surrounding fire: water spray, dry chemical, carbon dioxide, or foam.

Fire Fighting: Avoid inhalation of material or combustion byproducts. Wear full protective clothing and NIOSH-approved self-contained breathing apparatus (SCBA).

Flash Point (°C): N/A

Autoignition (°C): N/A

Flammability Limits in Air: N/A

Lower Explosive Limit (LEL): N/A

Upper Explosive Limit (UEL): N/A

Flammability Class (OSHA): N/A

Products of Combustion: Thermal decomposition products may include toxic sodium oxide and oxides of carbon.

6. ACCIDENTAL RELEASE MEASURES

Occupational Release: Isolate the spill area and warn people to avoid contact with the material. Cleanup personnel must wear appropriate personal protective equipment (Section 8). Scoop up spilled material and place in a suitable container for reclamation or disposal, using a method that does not generate dust. Ventilate the spill area. Flush residues and liquid spills to a holding tank for neutralization before discharge.

Disposal: Refer to Section 13, Disposal Considerations.

7. HANDLING AND STORAGE

Storage: Store in tightly closed original container. Avoid exposure to air, moisture, light, or incompatible materials (Section 10).

Safe Handling Precautions: If contact is unavoidable, wear appropriate protective clothing (Section 8). Wash contaminated clothing before re-use. Wash hands after handling this material. Do not eat or drink while handling this material.

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Exposure Limits: No TLV has been established for this material. Limits for total dust, nuisance dust, or particulates not otherwise classified:

ACGIH TLV-TWA: 10 mg/m^3 (inhalable particles); 3 mg/m^3 (respirable particles)
OSHA TWA-PEL: 15 mg/m^3 (total dust); 5 mg/m^3 (respirable dust)

Ventilation: Use local or general exhaust to keep employee exposures below limits. Local exhaust ventilation is preferred because it can control contaminant emissions at the source, preventing dispersion into the general work area. Refer to the ACGIH document *Industrial Ventilation, a Manual of Recommended Practices*.

Respirator: If necessary, refer to the "NIOSH Guide to the Selection and Use of Particulate Respirators Certified under 42 CFR 84" for selection and use of respirators certified by NIOSH.

Eye Protection: Use chemical safety goggles where dusting or splashing of solutions may occur. The employer should provide an emergency eye wash fountain and safety shower in the immediate work area.

Personal Protection: Wear appropriate gloves and protective clothing to minimize contact with skin.

9. PHYSICAL AND CHEMICAL PROPERTIES

Component: Sodium Carbonate

Appearance and Odor: Colorless to white crystalline powder, small crystals, or granules; no odor

Relative Molecular Weight: 105.99

Molecular Formula: Na_2CO_3

Density (g/cm^3): 2.54

Solvent Solubility: Soluble in glycerol; insoluble in alcohol and acetone

Water Solubility: Soluble

Boiling Point (°C): N/A, decomposes when heated

Melting Point (°C): 851 (1563.8 °F)

pH: 11.7, 10% aqueous solution @ 25°C (77°F)

10. STABILITY AND REACTIVITY

Stability: __X__ Stable _____Unstable

Stable at normal temperatures and pressure.

Conditions to Avoid: Exposure to heat, air, or moisture; incompatible materials.

Incompatible Materials: Fluorine (violent ignition); aluminum (hot), ammonia + silver nitrate, 2,4-dinitrotoluene, sodium sulfide (hot), 2,4,6-trinitrotoluene (explosion); sulfuric acid and other strong acids (violent reaction with effervescence); phosphorus pentoxide (exothermic reaction); water (exothermic reaction); lithium (burning releases reactive sodium); zinc (corrosive).

Fire/Explosion Information: See Section 5.

Hazardous Decomposition: Thermal decomposition products may include toxic sodium oxide and oxides of carbon.

Hazardous Polymerization: _____ Will Occur __X__ Will Not Occur

11. TOXICOLOGICAL INFORMATION

Route of Entry: __X__ Inhalation __X__ Skin __X__ Ingestion

Toxicity Data:

Guinea pig, inhalation (2 hrs): LC_{50} = 800 mg/m^3
Mouse, intraperitoneal: LD_{50} = 117 mg/kg
Mouse, inhalation (2 hrs): LC_{50} = 1200 mg/m^3
Mouse, oral: LD_{50} = 6600 mg/kg
Rabbit, eye (mild irritation, 30 sec): 100 mg
Rat, inhalation (2 hrs): LC_{50} = 2300 mg/m^3
Rat, oral: LD_{50} = 4090 mg/kg

Target Organ(s): Eyes, skin, respiratory tract, gastrointestinal tract.

Mutagen/Teratogen: This material is not known to cause mutations or birth defects. Standard mutagenicity testing has yielded negative results.

Health Effects: See Section 3.

12. ECOLOGICAL INFORMATION

Ecotoxicity Data:

Bluegill (*Lepomis macrochirus*): LC_{50} (24 hrs) = 385,000 µg/L
Fathead minnow (*Pimephales promelas*): LC_{50} (24 hrs) = 4,850,000 µg/L
Fathead minnow (*Pimephales promelas*): LC_{50} (96 hrs) = 850,000 µg/L

Environmental Summary: This material is not acutely toxic to most aquatic organisms tested.

13. DISPOSAL CONSIDERATIONS

Waste Disposal: Dispose of container and unused contents in accordance with federal, state, and local requirements, which vary according to location. Decontaminate containers before recycling. Processing, use, or contamination of this product may change the waste management options.

14. TRANSPORTATION INFORMATION

U.S. DOT and IATA: Not regulated.

15. REGULATORY INFORMATION

U.S. REGULATIONS

CERCLA Sections 102a/103 (40 CFR 302.4): Not regulated

SARA Title III Section 302: Not regulated

SARA Title III Section 304: Not regulated

SARA Title III Section 313: Not regulated

OSHA Process Safety (29 CFR 1910.119): Not regulated

SARA Title III Sections 311/312 Hazardous Categories (40 CFR 370.21):

ACUTE:	Yes
CHRONIC:	No
FIRE:	No
REACTIVE:	Yes
SUDDEN RELEASE:	No

STATE REGULATIONS

California Proposition 65: Not regulated

CANADIAN REGULATIONS

WHMIS Classification: D2B (poisonous material causing other toxic effects)

WHMIS Ingredient Disclosure List: Yes

EUROPEAN REGULATIONS

EU/EC Classification: Xi (irritant)

NATIONAL INVENTORY STATUS

U.S. Inventory (TSCA): Yes

TSCA 12(b), Export Notification: No

16. OTHER INFORMATION

Sources:

Fujita H, et al., Mutagenicity test of food additives with *Salmonella typhimurium* TA97 and TA102. *Tokyo-Toritsu Eisei Kenkyusho Kenkyu Nenpo* 1994; 45:191-199.

Hazardous Substances Data Base (HSDB): Sodium Carbonate.

Merck Index, 10th Edition, 1983. Rahway, NJ: Merck Co. Inc.

PAN Pesticide Database: Aquatic Ecotoxicity Data, Sodium Carbonate.